JAPANESE [JP,2957859,B]

CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF THE INVENTION TECHNICAL PROBLEM MEANS OPERATION EXAMPLE DESCRIPTION OF DRAWINGS DRAWINGS

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CLAIMS

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(57) [Claim(s)]
[Claim 1] The image support which an electrostatic latent image is formed in a front face, and carries out endless movement. The developer which a toner is made to adhere to the aforementioned electrostatic latent image in the development position which counters this image support through a predetermined gap, and forms a toner image. A concentration detection means to detect the concentration of the reference picture which is image formation equipment equipped with the above, and was formed on the aforementioned image support in the downstream of the aforementioned development position about the aforementioned image support move direction, A storage means to memorize the eccentric data in the Gentlemen phase of this image support on the basis of the home position on the aforementioned image support, It has a home-position detection means to detect the phase of the aforementioned reference picture on the basis of the aforementioned home position, and is characterized by an amendment and the thing based on the aforementioned eccentric data in the phase in which the aforementioned reference picture was formed in the concentration of the reference picture which the aforementioned concentration detection means detected.
[Claim 2] Image formation equipment according to claim 1 with which the aforementioned image support is characterized by what is formed with a diameter of 140mm or more in the shape of a drum.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] this invention relates to image formation equipments, such as copying machines, such as an electrophotography method which a developer is made to adhere to the latent image formed on the image support, and is formed into a visible image, and electrostatic recording, and a printer.
[0002]
[Description of the Prior Art] Conventionally, in image formation equipment, a patch picture is formed on a photo conductor using 2 component developer, the optical density is read, the amount of toner supply is controlled based on this read result, and what kept output picture concentration constant is known.
[0003] As an example of above-mentioned image formation equipment, the outline of full color image formation equipment is illustrated to drawing 8 .
[0004] Image formation equipment supported the photoconductor drum 1 as an image support free [rotation] in the arrow R1 direction, and arranges the corona-electrical-charging machine 2, optical system 3, a developer 5, imprint equipment 6, and the cleaning machine 7 to the circumference.
[0005] Optical system 3 is the laser beam aligner of the illustration which irradiates the light figure E which consists of the manuscript scanning section and a color separation filter, and is equivalent to the light figure E whose color was separated, or this at a photoconductor drum 1.
[0006] A light figure E is irradiated for every decomposition color, and an electrostatic latent image is formed in the photoconductor drum 1 uniformly charged with the electrification vessel 2. A developer 5 is used as a rotation development counter, arranges four development counter, i.e., black development counter 5BK, and cyano development counter 5C, Magenta development counter 5M, and yellow development counter 5Y around medial-axis 5a, rotates a predetermined development counter to the development position which counters a photoconductor drum 1, develops the electrostatic latent image on a photoconductor drum 1, and forms a toner image on a photoconductor drum 1 with the toner which made the resin the base.
[0007] Furthermore, the toner image on a photoconductor drum 1 is conveyed along with the paper path shown by this drawing middle point line through a conveyance system and imprint equipment 6 by the record material cassette 30, and is imprinted by the record material supplied to the photoconductor drum 1 and the position which countered. Adsorption roller 6d which counters adsorption corona-electrical-charging machine 6c for imprint equipment 6 carrying out electrostatic adsorption of imprint drum 6a, imprint corona-electrical-charging machine 6b, and the record material in this example, and this, Record material support sheet 6g which consists of a dielectric is stretched by the peripheral surface opening region of imprint drum 6a which has inside corona-electrical-charging machine 6e and 6f of outside corona-electrical-charging machines, and was supported to revolve so that a rotation drive might be carried out in one in the shape of a cylinder. The toner image on a photoconductor drum 1 is imprinted on the record material supported by record material support sheet 6g by imprint electrification machine

6b as imprint drum 6a rotates to an arrow R 2-way. The toner image of the color of further others is imprinted one by one by record material support sheet 6g at the record material by which adsorption conveyance is carried out, finally the color picture of the number of requests is imprinted, and a full color picture is formed.

[0008] Thus, after the imprint of the toner image of the number of requests is completed, it is separated from imprint drum 6a by the separation means 9, and record material is delivered to the delivery tray 31 through the heat roller fixing assembly 10. On the other hand, after a surface remains toner is cleaned by the cleaning machine 7, a series of image formation processes are again presented with the photoconductor drum 1 after an imprint.

[0009] Concentration control action of a developer is performed in parallel to an above-mentioned image formation process. The reference static latent image of the shape of a patch corresponding to the concentration beforehand defined like drawing 2 (it is called a "patch latent image" below.) This is developed with a toner and it is a patch-like reference picture (it is called a "patch picture" below.). It is referred to as P and light is irradiated at this patch picture P from Light Emitting Diode11a of the concentration detection sensor (concentration detection means) of the amount detection method of optical reflected lights. Receive the reflected light by photodiode 11b, and the concentration of the patch picture P is detected. From this concentration being equivalent to the toner concentration of 2 component developer in a developer 5 The toner of the specified quantity by supplying into a developer 5 from a toner supply tub by taking difference for this detected concentration as compared with a reference value, computing the amount of change of developer concentration based on this difference, and converting this into the amount of toner supply (supply time) It is controlling to keep output picture concentration constant.

[0010]

[Problem(s) to be Solved by the Invention] however, in an above-mentioned Prior art, although develop the patch latent image formed on the image support, consider as the patch picture P, and the reflection density of this patch picture P is detected by the concentration detection sensor, and it is alike as a result, it is based and the toner is supplied As shown in drawing 3 , there is eccentricity in a photoconductor drum 1 in a Gentlemen phase, and it is a predetermined gap between a photoconductor drum 1 and the development sleeve of a developer (it is called a "S-D gap" below.). It will change and development efficiency will change. Drawing 4 is the concentration detection sensor output characteristics to output picture concentration. As shown in this drawing, when changing a S-D gap, picture concentration will become unstable and a concentration detection sensor output will also be changed sharply. For this reason, if the image formation position on a photoconductor drum 1 changes even if it is the same developer concentration, in order for the output of a concentration detection sensor to change, to judge this that developer concentration changed and to perform toner supply to a developer, there is a problem that developer concentration and picture concentration will be in an unstable state.

[0011] Then, this invention aims at offering the image formation equipment which maintained developer concentration and output picture concentration uniformly by adding the amendment based on the eccentricity of an image support to the output of a concentration detection means.

[0012]

[Means for Solving the Problem] The image support which this invention is made in view of the above-mentioned situation, and an electrostatic latent image is formed in a front face, and carries out endless movement, In image formation equipment equipped with the developer which a toner is made to adhere to the aforementioned electrostatic latent image in the development position which counters this image support through a predetermined gap, and forms a toner image A concentration detection means to detect the concentration of the reference picture formed on the aforementioned image support in the downstream of the aforementioned development position about the aforementioned image support move direction, A storage means to memorize the eccentric data in the Gentlemen phase of this image support on the basis of the home position on the aforementioned image support, the aforementioned eccentric data in the phase in which the aforementioned reference picture was formed in the concentration of the reference picture which was equipped with a home-position detection means to detect the phase of the

aforementioned reference picture on the basis of the aforementioned home position, and the aforementioned concentration detection means detected -- being based -- an amendment -- it is characterized by things

[0013] Moreover, you may form the aforementioned image support with a diameter of 140mm or more in the shape of a drum.

[0014]

[Function] The concentration of the reference picture which a concentration detection means detects based on composition above changes with the eccentricity of the image support in the position in which the reference picture is formed, i.e., the distance of a concentration detection means and a reference picture. That is, since eccentricity will change if the positions formed differ even if the concentration of a reference picture is fixed, it will be detected as different concentration. While preparing a home position on an image support and memorizing the eccentric data in the Gentlemen phase of an image support on the basis of this home position, the phase of the position in which the reference picture was formed on the basis of the same home position is detected. The eccentricity of the image support in the position in which the reference picture was formed can be detected by this, amendment can be added to the detection concentration of a reference picture based on this eccentricity, and regular concentration can be known.

[0015]

[Example] Hereafter, the example of this invention is explained along with a drawing.

<Example 1> The schematic diagram of the color picture formation equipment for forming a full color picture in drawing 1 as an example of the image formation equipment concerning this invention is shown.

[0016] The image formation equipment of this example is supported free [rotation in arrow R1 direction] for the photoconductor drum 1 which is an image support. Around this photoconductor drum 1, the corona-electrical-charging machine 2, optical system 3, a developer 5, imprint equipment 6, and the cleaning machine 7 are arranged in order along with the hand of cut.

[0017] Irradiate the light figure E which consists of the manuscript scanning section and a color separation filter, and is equivalent to the light figure E whose color was separated, or this at a photoconductor drum 1, for example, optical system 3 is the laser beam aligner of illustration.

[0018] A light figure E is irradiated for every decomposition color, and an electrostatic latent image is formed in the photoconductor drum 1 uniformly charged with the electrification vessel 2. Body-of-revolution 5b which a developer 5 is used as a rotation development counter, and rotates medial-axis 5a as a center, And four development counters carried in it, i.e., black development counter 5BK, It has cyano development counter 5C, Magenta development counter 5M, and yellow development counter 5Y, and the toner which was made to rotate a predetermined development counter to the development position which countered the photoconductor drum 1, and made the resin the base at the electrostatic latent image on a photoconductor drum 1 is made to adhere, negatives are developed, and a toner image is formed on a photoconductor drum 1.

[0019] furthermore, the toner image on a photoconductor drum 1 is imprinted with a photoconductor drum 1 through a conveyance system and imprint equipment 6 by the imprint position N which counters at the record material supplied (the paper path shown by the drawing middle point line -- following -- arrow K1 direction) from a record material cassette (un-illustrating) Adsorption roller 6d which counters adsorption corona-electrical-charging machine 6c for imprint equipment 6 carrying out electrostatic adsorption of imprint drum 6a, imprint corona-electrical-charging machine 6b, and the record material in this example, and this, Record material support sheet 6g which consists of a dielectric is stretched by the peripheral surface opening region of imprint drum 6a which has inside corona-electrical-charging machine 6e and 6f of outside corona-electrical-charging machines, and was supported to revolve so that a rotation drive might be carried out in one in the shape of a cylinder. The toner image on a photoconductor drum 1 is imprinted on the record material supported by record material support sheet 6g by imprint electrification machine 6b as imprint drum 6a rotates. The color picture of the number of requests is imprinted by record material support sheet 6g at the record material by which adsorption

conveyance is carried out, and a full color picture is formed.
[0020] Thus, after the imprint of the toner image of the number of requests is completed, it is separated from imprint drum 6a by the separation means 9, and record material acquires an output picture through the heat roller fixing assembly 10. On the other hand, after the photoconductor drum 1 after an imprint is cleaned by the cleaning machine 7 in a surface remains toner, an image formation process is again presented with it.
[0021] Concentration control of a developer is performed in parallel to a series of above-mentioned image formation processes. The patch latent image (reference static latent image) of the shape of a patch corresponding to the concentration beforehand defined like drawing 2 is formed on a photoconductor drum 1. This is developed with a toner, it considers as the patch-like patch picture (reference picture) P, light is irradiated at this patch picture P from Light Emitting Diode11a of the concentration detection sensor (concentration detection means) 11 of the amount detection method of optical reflected lights, the reflected light is received by photodiode 11b, and the concentration of the patch picture P is detected. It is controlling to keep output picture concentration constant by adding amendment to the output of the concentration detection sensor 11 based on the photoconductor drum eccentricity of a patch image formation position, comparing the correction value and reference value, taking difference, computing the amount of change of developer concentration, converting this into the amount of toner supply (supply time), and supplying the toner of the specified quantity into a developer 5 from a toner supply tub from this difference.
[0022] Drawing 3 is drawing when measuring the eccentricity of a photoconductor drum 1 for every Gentlemen phase in a development position, a S-D gap is changed with this eccentricity, and picture concentration and a concentration detection sensor output change like drawing 4 . The storage means (un-illustrating) is made to memorize the eccentricity for every Gentlemen phase of a photoconductor drum 1 on the basis of the home position M set up on the photoconductor drum 1.
[0023] As shown in drawing 1 , near the concentration detection sensor 11, a photoconductor drum 1 can be made to be able to counter, the home-position sensor (home-position detection means) 12 can be formed, and the variation of the concentration detection sensor output by S-D gap change of the position in which the patch picture P is formed of the position of a home position M, the eccentric data of a photoconductor drum 1, and the phase from the home position M to the patch picture P can be computed. That is, developer concentration 5wt%, supposing it is S-D gap 500micrometer, terms and conditions Supposing the home position M of a photoconductor drum 1 is located in the position of A of drawing 3 and it forms the patch picture P in the position of B A concentration detection sensor output serves as a low value (0.95V) from drawing 4 from 50mV proper value with the eccentricity (a S-D gap is [+25 micrometers and] 475 micrometers at this time) in the position of B, and it is detected (however, let the direction of + of eccentricity be the direction by which a S-D gap is shortened.). . Therefore, 50mV can be added to the detection output of the concentration detection sensor 11, and the present amount of developer concentration change can be correctly detected by the differential signal with a reference value (patch concentration detection sensor output 1.0V at the time of eccentricity 0). Moreover, if the patch picture P was similarly formed in C position of drawing 3 , a S-D gap serves as 550 micrometers of 50-micrometer latus, about 100mV output signal is detected highly (1.1V), 100mV is subtracted from the detection output, and an exact signal is acquired by taking difference with a reference value. That is, mechanically or electrically, the home-position sensor 12 can be formed in a photoconductor drum 1, memory of the eccentric data of a photoconductor drum 1 can be carried out, and the developer concentration and the output picture which measured the phase to a patch formation position, amended S-D gap change and output change of the concentration detection sensor 11 with the phase contrast, and were stabilized from the home position M can be acquired.
[0024] In addition, in this example, although the black toner of carbon content is used, it cannot be based on content or the color of carbon, but the same effect can be acquired.
<Example 2> Drawing 5 is the whole full color copying machine block diagram.
[0025] This copying machine has the digital color picture reader section I in the upper part, and has the digital color picture printer section II in the lower part.

[0026] In the reader section I, by carrying a manuscript on manuscript base glass 21, and carrying out an exposure scan with the exposure lamp 22, the reflected light image from a manuscript is condensed in the full color sensor 25 with a lens 23, and a color color-separation picture signal is acquired. Through an amplifying circuit, a color color-separation picture signal is processed in a video-processing unit (all are un-illustrating), and printer sending out is carried out.
[0027] They are four development counters 5Y and 5C with which the photoconductor drum 1 which is an image support is supported free [rotation] in the arrow R1 direction in the printer section II, and the pre-exposure lamp 26, the corona-electrical-charging machine 2, the laser exposure optical system 3, and the potential sensor 27 differ from a color around a photoconductor drum 1. 5M, 5BK, the drum-lifting quantity of light detection means (concentration detection sensor) 11, imprint equipment 6, and the cleaning machine 7 are arranged.
[0028] In the laser exposure optical system 3, the laser beam changed and changed into the lightwave signal in the laser output section (un-illustrating) is reflected by polygon mirror 3a, and the picture signal from the reader section I is projected on the front face of a photoconductor drum 1 through lens 3b and mirror 3c.
[0029] At the time of the image formation of the printer section II, a photoconductor drum 1 is rotated in the arrow R1 direction, the photoconductor drum 1 after discharging electricity with the pre-exposure lamp 26 is uniformly electrified with the electrification vessel 2, a light figure E is irradiated for every decomposition color, and an electrostatic latent image is formed.
[0030] Next, a predetermined development counter is operated, the electrostatic latent image on a photoconductor drum 1 is developed, and the toner image which made the resin the base is formed on a photoconductor drum 1. Each development counter is constituted so that a photoconductor drum 1 may be alternatively approached according to each decomposition color by operation of eccentric cams 29Y, 29C, and 29M and 29BK.
[0031] Furthermore, the toner image on a photoconductor drum 1 is imprinted to the record material supplied to the position which countered with the photoconductor drum 1 through a conveyance system and imprint equipment 6 from the record material cassette 30. Adsorption roller 6d which counters adsorption-zone electrical machinery 6c for imprint equipment 6 carrying out electrostatic adsorption of imprint drum 6a, imprint electrification machine 6b, and the record material in this example, and this, In the peripheral surface opening region of imprint drum 6a which has inside electrification machine 6e and 6f of outside electrification machines, and was supported to revolve so that a rotation drive might be carried out, record material support sheet 6g which consists of a dielectric is stretched in one in the shape of a cylinder. Dielectric sheets, such as a poly carbon NETO film, are used record material support sheet 6g.
[0032] The toner image on a photoconductor drum 1 is imprinted on the record material supported by record material support sheet 6g by imprint electrification machine 6b as the imprint equipment made into the shape of a drum, i.e., imprint drum 6a, is rotated.
[0033] Thus, the color picture of the number of requests is imprinted by record material support sheet 6g at the record material by which adsorption conveyance is carried out, and a full color picture is formed.
[0034] In the case of full color image formation, after ending the imprint of the toner image of four colors, an operation of separation presser-foot-stitch-tongue 9a, separation push raising koro 9b, and 6h of separator electrical machinery separates record material from imprint drum 6a, and it discharges on the delivery tray 31 through the heat roller fixing assembly 10.
[0035] after [on the other hand,], as for the photoconductor drum 1 after an imprint, the surface remains toner was cleaned by the cleaning machine 7 -- a degree -- an image formation process is presented
[0036] Moreover, in order to prevent scattering adhesion of the fine particles on the record material support sheet 6 of imprint drum 6a, adhesion of the oil on record material, etc., an operation of the fur brush 32, the backup brush 33 which counters this brush 32 through record material support sheet 6g, and the oil removal roller 35 and the backup brush 36 which counters this roller 35 through record material support sheet 6g cleans. Such cleaning is performed before image formation or to the back, and is performed at any time at the time of jam (paper jam) generating.

[0037] Concentration control action of a developer is performed in parallel to an above-mentioned image formation process. Beforehand, the eccentricity of a photoconductor drum 1 is measured and memory of the relation with a home position M is carried out. Next, the patch picture P is formed and concentration is detected by the concentration detection sensor 11. And developer concentration and output picture concentration can be stabilized by amending to a concentration detection output based on the eccentricity by the phase contrast of a patch image formation position and a home position M, computing the amount of change of developer concentration as compared with a reference value, converting this to the amount of toner supply, and supplying a developer. Although drawing 6 measures eccentricity in case the diameter of a photoconductor drum 1 is 180mm, the more a diameter becomes large, eccentricity increases and the picture concentration nonuniformity by eccentricity becomes easy to be conspicuous the more from the hit exceeding the diameter of 140mm. Especially when a photoconductor drum 1 is a major diameter in this way and it is going to obtain high definition, the effect of this invention is large.

<Example 3> Especially with the image formation equipment using the photoconductor drum 1 of a major diameter like an example 2, as the electrification potential of the photoconductor drum 1 with the electrification machine 2 shows a (solid line) of drawing 7 with the eccentricity of a photoconductor drum 1, it will change with the period of eccentricity. The home position M could be given and detected to the photoconductor drum 1, the eccentricity of a photoconductor drum 1 was able to be detected, as by amending on the electrification voltage of the electrification machine 2 showed to b (alternate long and short dash line) of this drawing, the nonuniformity by electrification was able to be decreased, and the uniform output picture was able to be acquired.

[0038]

[Effect of the Invention] the concentration of the reference picture which was formed on the image support according to this invention as explained above -- detecting -- facing -- a home-position detection means etc. -- minding -- the eccentricity of an image support -- detecting -- this -- being based -- detection concentration -- an amendment -- exact concentration can be obtained by things Therefore, by performing supply of a toner to a developer etc., the predetermined toner concentration in 2 component developer can be maintained based on this exact concentration, the concentration nonuniformity of a final output picture can be lost on it, and the picture of good concentration can be formed in it.

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TECHNICAL FIELD

[Industrial Application] this invention relates to image formation equipments, such as copying machines, such as an electrophotography method which a developer is made to adhere to the latent image formed on the image support, and is formed into a visible image, and electrostatic recording, and a printer.

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PRIOR ART

[Description of the Prior Art] Conventionally, in image formation equipment, a patch picture is formed on a photo conductor using 2 component developer, the optical density is read, the amount of toner supply is controlled based on this read result, and what kept output picture concentration constant is known.
[0003] As an example of above-mentioned image formation equipment, the outline of full color image formation equipment is illustrated to drawing 8 .
[0004] Image formation equipment supported the photoconductor drum 1 as an image support free [rotation] in the arrow R1 direction, and arranges the corona-electrical-charging machine 2, optical system 3, a developer 5, imprint equipment 6, and the cleaning machine 7 to the circumference.
[0005] Optical system 3 is the laser beam aligner of the illustration which irradiates the light figure E which consists of the manuscript scanning section and a color separation filter, and is equivalent to the light figure E whose color was separated, or this at a photoconductor drum 1.
[0006] A light figure E is irradiated for every decomposition color, and an electrostatic latent image is formed in the photoconductor drum 1 uniformly charged with the electrification vessel 2. A developer 5 is used as a rotation development counter, arranges four development counter, i.e., black development counter 5BK, and cyano development counter 5C, Magenta development counter 5M, and yellow development counter 5Y around medial-axis 5a, rotates a predetermined development counter to the development position which counters a photoconductor drum 1, develops the electrostatic latent image on a photoconductor drum 1, and forms a toner image on a photoconductor drum 1 with the toner which made the resin the base.
[0007] Furthermore, the toner image on a photoconductor drum 1 is conveyed along with the paper path shown by this drawing middle point line through a conveyance system and imprint equipment 6 by the record material cassette 30, and is imprinted by the record material supplied to the photoconductor drum 1 and the position which countered. Adsorption roller 6d which counters adsorption corona-electrical-charging machine 6c for imprint equipment 6 carrying out electrostatic adsorption of imprint drum 6a, imprint corona-electrical-charging machine 6b, and the record material in this example, and this, Record material support sheet 6g which consists of a dielectric is stretched by the peripheral surface opening region of imprint drum 6a which has inside corona-electrical-charging machine 6e and 6f of outside corona-electrical-charging machines, and was supported to revolve so that a rotation drive might be carried out in one in the shape of a cylinder. The toner image on a photoconductor drum 1 is imprinted on the record material supported by record material support sheet 6g by imprint electrification machine 6b as imprint drum 6a rotates to an arrow R 2-way. The toner image of the color of further others is imprinted one by one by record material support sheet 6g at the record material by which adsorption conveyance is carried out, finally the color picture of the number of requests is imprinted, and a full color picture is formed.
[0008] Thus, after the imprint of the toner image of the number of requests is completed, it is separated from imprint drum 6a by the separation means 9, and record material is delivered to the delivery tray 31 through the heat roller fixing assembly 10. On the other hand, after a surface remains toner is cleaned by

the cleaning machine 7, a series of image formation processes are again presented with the photoconductor drum 1 after an imprint.
[0009] Concentration control action of a developer is performed in parallel to an above-mentioned image formation process. The reference static latent image (henceforth a "patch latent image") of the shape of a patch corresponding to the concentration defined beforehand is formed on a photoconductor drum 1 like drawing 2 , and this is developed with a toner, and it considers as the patch-like reference picture (henceforth a "patch picture") P, and is the concentration detection sensor of the amount detection method of optical reflected lights to this patch picture P.

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EFFECT OF THE INVENTION

[Effect of the Invention] the concentration of the reference picture which was formed on the image support according to this invention as explained above -- detecting -- facing -- a home-position detection means etc. -- minding -- the eccentricity of an image support -- detecting -- this -- being based -- detection concentration -- an amendment -- exact concentration can be obtained by things Therefore, by performing supply of a toner to a developer etc., the predetermined toner concentration in 2 component developer can be maintained based on this exact concentration, the concentration nonuniformity of a final output picture can be lost on it, and the picture of good concentration can be formed in it.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] however, in an above-mentioned Prior art, although develop the patch latent image formed on the image support, consider as the patch picture P, and the reflection density of this patch picture P is detected by the concentration detection sensor, and it is alike as a result, it is based and the toner is supplied As shown in drawing 3 , there is eccentricity in a photoconductor drum 1 in a Gentlemen phase, and it is a predetermined gap between a photoconductor drum 1 and the development sleeve of a developer (it is called a "S-D gap" below.). It will change and development efficiency will change. Drawing 4 is the concentration detection sensor output characteristics to output picture concentration. As shown in this drawing, when changing a S-D gap, picture concentration will become unstable and a concentration detection sensor output will also be changed sharply. For this reason, if the image formation position on a photoconductor drum 1 changes even if it is the same developer concentration, in order for the output of a concentration detection sensor to change, to judge this that developer concentration changed and to perform toner supply to a developer, there is a problem that developer concentration and picture concentration will be in an unstable state.
[0011] Then, this invention aims at offering the image formation equipment which maintained developer concentration and output picture concentration uniformly by adding the amendment based on the eccentricity of an image support to the output of a concentration detection means.

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OPERATION

[Function] The concentration of the reference picture which a concentration detection means detects based on composition above changes with the eccentricity of the image support in the position in which the reference picture is formed, i.e., the distance of a concentration detection means and a reference picture. That is, since eccentricity will change if the positions formed differ even if the concentration of a reference picture is fixed, it will be detected as different concentration. While preparing a home position on an image support and memorizing the eccentric data in the Gentlemen phase of an image support on the basis of this home position, the phase of the position in which the reference picture was formed on the basis of the same home position is detected. The eccentricity of the image support in the position in which the reference picture was formed can be detected by this, amendment can be added to the detection concentration of a reference picture based on this eccentricity, and regular concentration can be known.

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EXAMPLE

[Example] Hereafter, the example of this invention is explained along with a drawing.
<Example 1> The schematic diagram of the color picture formation equipment for forming a full color picture in drawing 1 as an example of the image formation equipment concerning this invention is shown.
[0016] The image formation equipment of this example is supported free [rotation in arrow R1 direction] for the photoconductor drum 1 which is an image support. Around this photoconductor drum 1, the corona-electrical-charging machine 2, optical system 3, a developer 5, imprint equipment 6, and the cleaning machine 7 are arranged in order along with the hand of cut.
[0017] Irradiate the light figure E which consists of the manuscript scanning section and a color separation filter, and is equivalent to the light figure E whose color was separated, or this at a photoconductor drum 1, for example, optical system 3 is the laser beam aligner of illustration.
[0018] A light figure E is irradiated for every decomposition color, and an electrostatic latent image is formed in the photoconductor drum 1 uniformly charged with the electrification vessel 2. Body-of-revolution 5b which a developer 5 is used as a rotation development counter, and rotates medial-axis 5a as a center, And four development counters carried in it, i.e., black development counter 5BK, It has cyano development counter 5C, Magenta development counter 5M, and yellow development counter 5Y, and the toner which was made to rotate a predetermined development counter to the development position which countered the photoconductor drum 1, and made the resin the base at the electrostatic latent image on a photoconductor drum 1 is made to adhere, negatives are developed, and a toner image is formed on a photoconductor drum 1.
[0019] furthermore, the toner image on a photoconductor drum 1 is imprinted with a photoconductor drum 1 through a conveyance system and imprint equipment 6 by the imprint position N which counters at the record material supplied (the paper path shown by the drawing middle point line -- following -- arrow K1 direction) from a record material cassette (un-illustrating) Adsorption roller 6d which counters adsorption corona-electrical-charging machine 6c for imprint equipment 6 carrying out electrostatic adsorption of imprint drum 6a, imprint corona-electrical-charging machine 6b, and the record material in this example, and this, Record material support sheet 6g which consists of a dielectric is stretched by the peripheral surface opening region of imprint drum 6a which has inside corona-electrical-charging machine 6e and 6f of outside corona-electrical-charging machines, and was supported to revolve so that a rotation drive might be carried out in one in the shape of a cylinder. The toner image on a photoconductor drum 1 is imprinted on the record material supported by record material support sheet 6g by imprint electrification machine 6b as imprint drum 6a rotates. The color picture of the number of requests is imprinted by record material support sheet 6g at the record material by which adsorption conveyance is carried out, and a full color picture is formed.
[0020] Thus, after the imprint of the toner image of the number of requests is completed, it is separated from imprint drum 6a by the separation means 9, and record material acquires an output picture through the heat roller fixing assembly 10. On the other hand, after the photoconductor drum 1 after an imprint is cleaned by the cleaning machine 7 in a surface remains toner, an image formation process is again

presented with it.
[0021] Concentration control of a developer is performed in parallel to a series of above-mentioned image formation processes. The patch latent image (reference static latent image) of the shape of a patch corresponding to the concentration beforehand defined like drawing 2 is formed on a photoconductor drum 1, and this is developed with a toner, and it considers as the patch-like patch picture (reference picture) P, and is the concentration detection sensor of the amount detection method of optical reflected lights to this patch picture P.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] Drawing of longitudinal section showing the outline of the image formation equipment of an example 1.
[Drawing 2] The perspective diagram showing the composition of a concentration detection sensor.
[Drawing 3] Drawing showing the state of the eccentricity of a photoconductor drum.
[Drawing 4] Drawing showing the relation between a S-D gap and the output of a concentration detection sensor.
[Drawing 5] Drawing of longitudinal section showing the outline of the image formation equipment of an example 2.
[Drawing 6] Drawing showing the state of the eccentricity of the photoconductor drum of a major diameter (diameter of 180mm) of an example 2.
[Drawing 7] Drawing showing the electrification nonuniformity by the eccentricity of a photoconductor drum.
[Drawing 8] Drawing of longitudinal section showing the outline of conventional image formation equipment.
[Description of Notations]
1 Image Support (Photoconductor Drum)
5 Developer
11 Concentration Detection Means (Concentration Detection Sensor)
12 Home-Position Detection Means (Home-Position Sensor)
M Home position
P Reference picture (patch picture)

[Translation done.]

* NOTICES *

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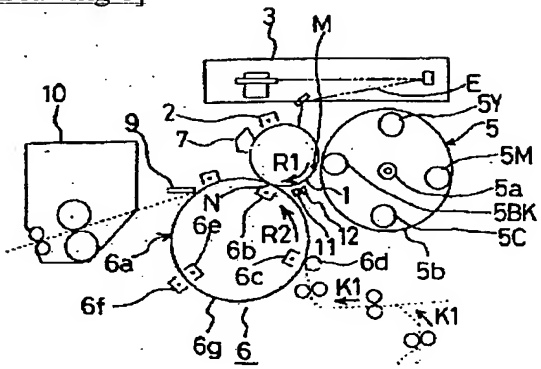
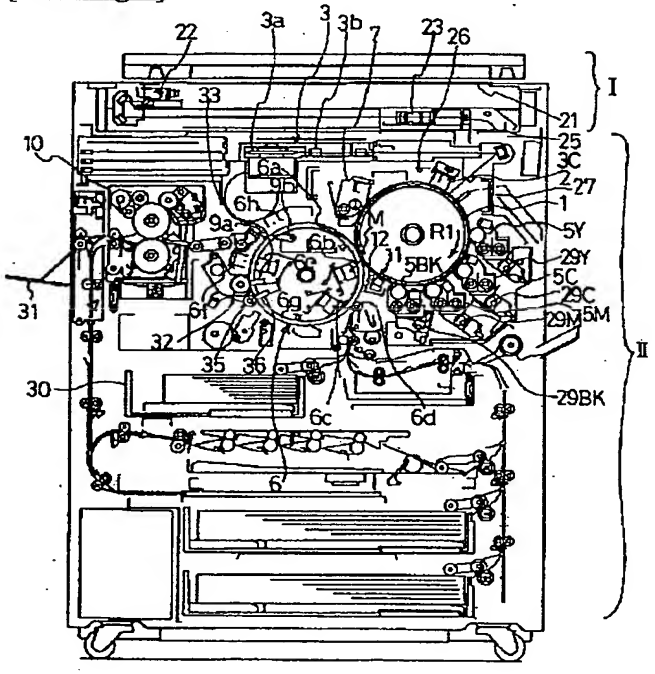
DRAWINGS

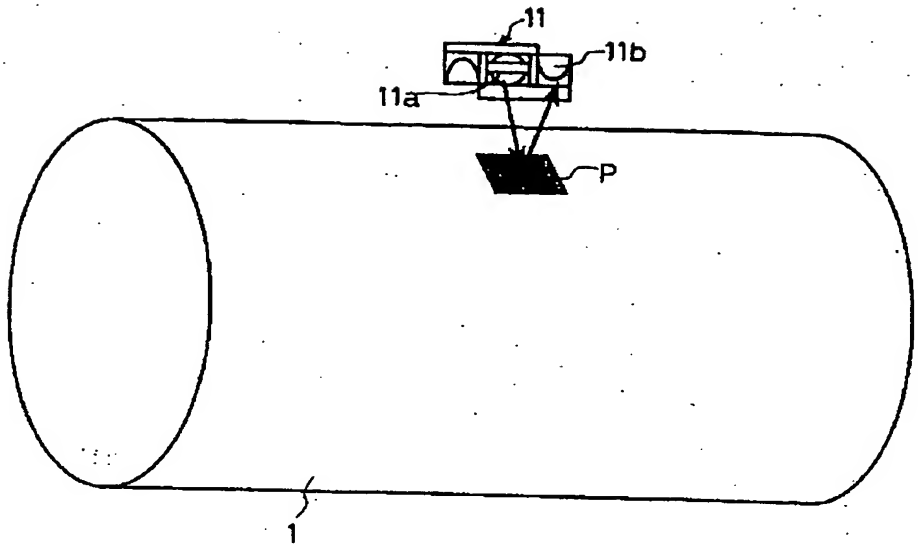
[Drawing 1]



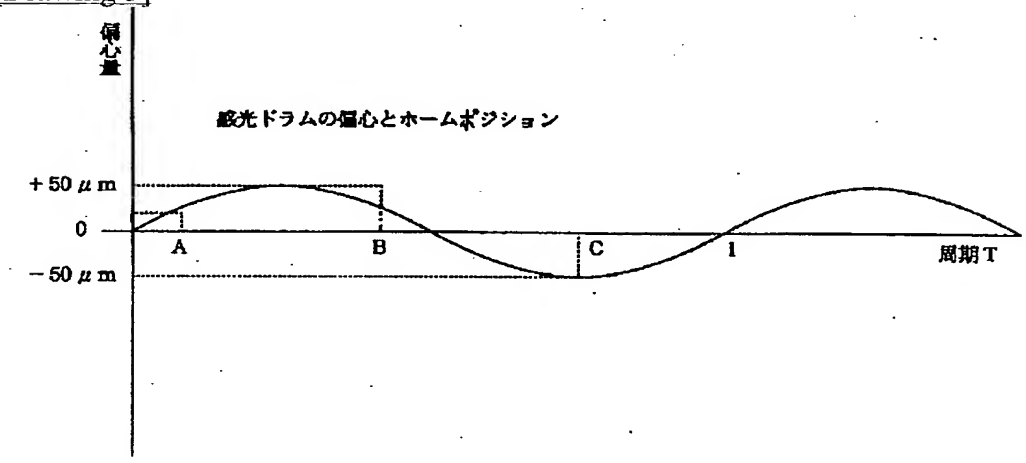
[Drawing 5]



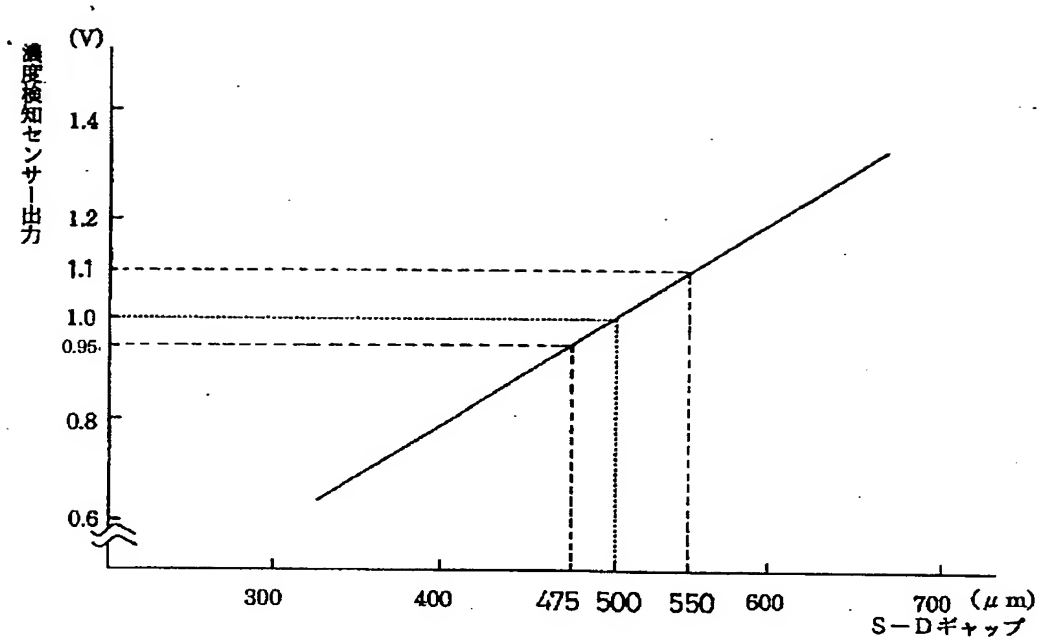
[Drawing 2]



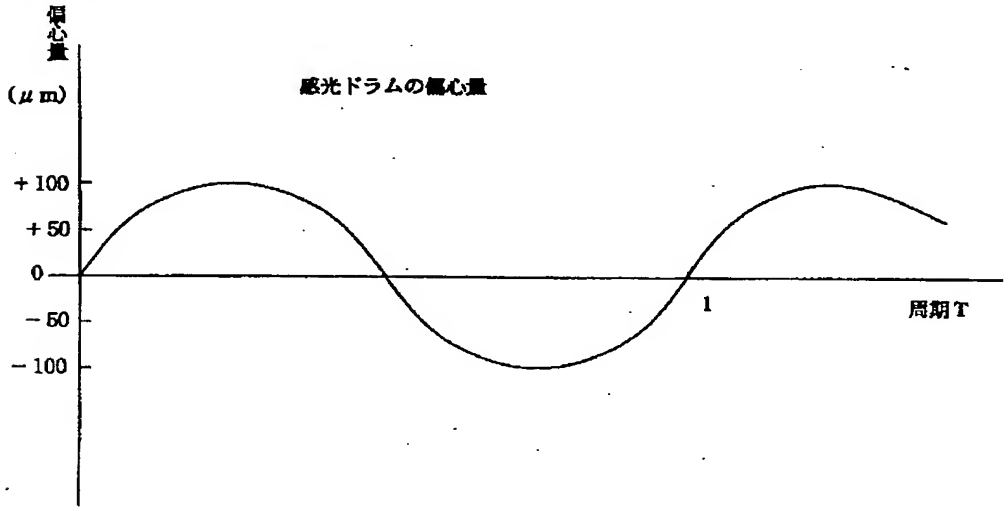
[Drawing 3]



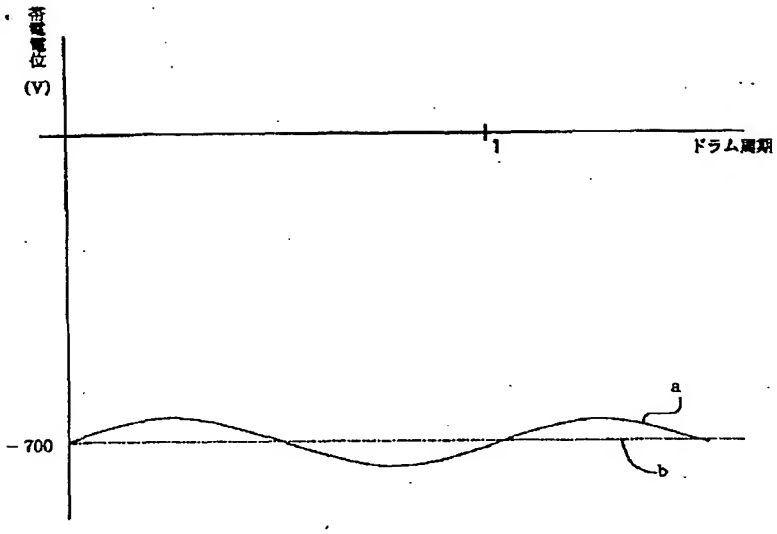
[Drawing 4]



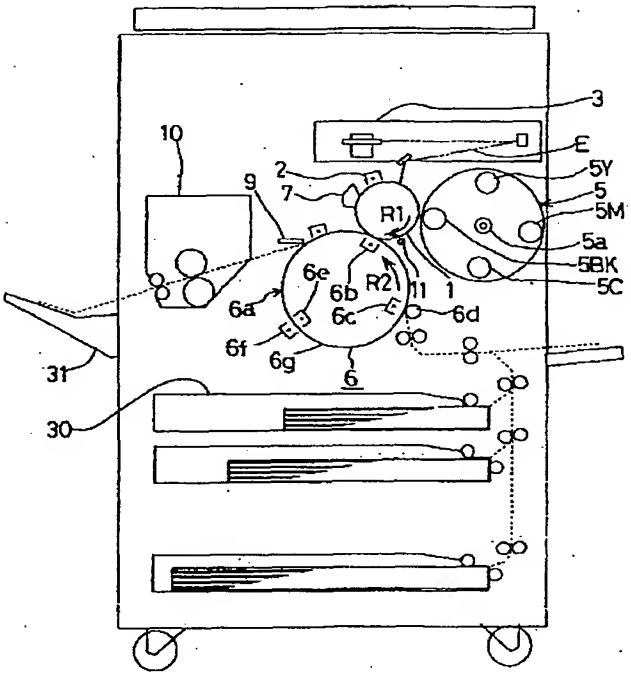
[Drawing 6]



[Drawing 7]



[Drawing 8]



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(56)参考文献　特開　平２－76754（ＪＰ，Ａ）
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最終頁に続く

(54)【発明の名称】　画像形成装置

(57)【特許請求の範囲】

【請求項１】　表面に静電潜像が形成され無端移動する像担持体と、該像担持体に所定間隙を介して対向する現像位置にて前記静電潜像にトナーを付着させてトナー像を形成する現像装置とを備えた画像形成装置において、

前記像担持体移動方向についての、前記現像位置の下流側にて、前記像担持体上に形成された参照画像の濃度を検知する濃度検知手段と、

前記像担持体上のホームポジションを基準とした該像担持体の各位相における偏心データを記憶する記憶手段と、

前記ホームポジションを基準とした前記参照画像の位相を検知するホームポジション検知手段と、を備え、

前記濃度検知手段が検知した参照画像の濃度を、前記参照画像が形成された位相における前記偏心データに基づいて補正する、

ことを特徴とする画像形成装置。

【請求項２】　前記像担持体が直径１４０㎜以上のドラム状に形成されている、

ことを特徴とする請求項１記載の画像形成装置。

【発明の詳細な説明】

【０００１】

【産業上の利用分野】本発明は像担持体上に形成された潜像に現像剤を付着させて可視像化する電子写真方式や静電記録方式などの複写機、プリンタ等の画像形成装置に関する。

【０００２】

【従来の技術】従来、画像形成装置において、２成分現像剤を用いて感光体上にパッチ画像を形成して、その光学濃度を読取り、この読取り結果に基づいて、トナー補

給量を制御し、出力画像濃度を一定に保つようにしたものが知られている。

【０００３】上述の画像形成装置の例として、図８に、フルカラー画像形成装置の概略を図示する。

【０００４】画像形成装置は、像担持体としての感光ドラム１を矢印Ｒ１方向に回転自在に支持し、その周囲に、コロナ帯電器２、光学系３、現像装置５、転写装置６、クリーニング器７を配置している。

【０００５】光学系３は、原稿走査部と色分解フィルタからなり、色分解された光像Ｅ、またはこれに相当する光像Ｅを感光ドラム１に照射する例えば図示のレーザビーム露光装置である。

【０００６】帯電器２により一様に帯電された感光ドラム１に、各分解色ごとに光像Ｅを照射し、静電潜像を形成する。現像装置５は回転現像器とされ、中心軸５ａの周りに４個の現像器、すなわちブラック現像器５ＢＫ、シアン現像器５Ｃ、マゼンタ現像器５Ｍ、イエロー現像器５Ｙを配置し、所定の現像器を感光ドラム１に対向する現像位置へと回転させて感光ドラム１上の静電潜像を現像し、感光ドラム１上に樹脂を基体としたトナーによってトナー像を形成する。

【０００７】さらに、感光ドラム１上のトナー像は、記録材カセット３０により搬送系及び転写装置６を介して、同図中点線にて示す紙パスに沿って搬送され、感光ドラム１と対向した位置に供給された記録材に転写される。転写装置６は、本例では転写ドラム６ａ、転写コロナ帯電器６ｂ、記録材を静電吸着させるための吸着コロナ帯電器６ｃとこれに対向する吸着ローラ６ｄ、内側コロナ帯電器６ｅ、外側コロナ帯電器６ｆとを有し、回転駆動されるように軸支された転写ドラム６ａの周面開口域には誘電体からなる記録材担持シート６ｇが円筒状に一体的に張設されている。転写ドラム６ａが矢印Ｒ２方向に回転するに従って、感光ドラム１上のトナー像は転写帯電器６ｂにより記録材担持シート６ｇに担持された記録材上に転写される。記録材担持シート６ｇに吸着搬送されている記録材には、さらに他の色のトナー像が順次転写され、最終的に所望数の色画像が転写されてフルカラー画像が形成される。

【０００８】このようにして所望数のトナー像の転写が終了すると、記録材は転写ドラム６ａから分離手段９によって分離され、熱ローラ定着器１０を介して排紙トレイ３１に排紙される。他方、転写後の感光ドラム１は、表面の残留トナーがクリーニング器７で清掃された後、再度、一連の画像形成プロセスに供せられる。

【０００９】現像剤の濃度制御動作は、上述の画像形成プロセスと並行して行われる。図２のように、予め定められた濃度に対応するパッチ状の参照静電潜像（以下「パッチ潜像」という。）を感光ドラム１上に形成し、これをトナーで現像してパッチ状の参照画像（以下「パッチ画像」という。）Ｐとし、このパッチ画像Ｐに光学反射光量検知方式の濃度検知センサ（濃度検知手段）のＬＥＤ１１ａから光を照射し、その反射光をフォトダイオード１１ｂで受光してパッチ画像Ｐの濃度を検知し、この濃度が現像装置５内の２成分現像剤のトナー濃度に対応することから、この検知した濃度を基準値と比較して差分を取り、この差分に基づいて現像剤濃度の変動量を算出し、これをトナー補給量（補給時間）に換算し、トナー補給槽から所定量のトナーを現像装置５内へ補給を行うことにより、出力画像濃度を一定に保つように制御している。

【００１０】

【発明が解決しようとする課題】しかしながら、上述の従来の技術においては、像担持体上に形成されたパッチ潜像を現像してパッチ画像Ｐとし、このパッチ画像Ｐの反射濃度を濃度検知センサで検知し、この結果に基づいてトナーの補給を行っているが、図３に示すように感光ドラム１には各位相において偏心があり、感光ドラム１と現像装置の現像スリーブとの間の所定間隙（以下「Ｓ－Ｄギャップ」という。）が変動して現像効率が変化してしまう。図４は出力画像濃度に対する濃度検知センサ出力特性である。この図から解るようにＳ－Ｄギャップが変動することによって画像濃度が不安定になり濃度検知センサ出力も大きく変動してしまう。このため、同じ現像剤濃度であっても感光ドラム１上の像形成位置が変化すると、濃度検知センサの出力が変わってしまい、これを現像剤濃度が変化したと判断して、現像装置に対するトナー補給を行ってしまうため、現像剤濃度、画像濃度が不安定な状態となってしまうという問題がある。

【００１１】そこで、本発明は、濃度検知手段の出力に、像担持体の偏心に基づく補正を加えることによって、現像剤濃度、出力画像濃度を一定に維持するようにした画像形成装置を提供することを目的とするものである。

【００１２】

【課題を解決するための手段】本発明は、上述事情に鑑みてなされたものであって、表面に静電潜像が形成され無端移動する像担持体と、該像担持体に所定間隙を介して対向する現像位置にて前記静電潜像にトナーを付着させてトナー像を形成する現像装置とを備えた画像形成装置において、前記像担持体移動方向についての、前記現像位置の下流側にて、前記像担持体上に形成された参照画像の濃度を検知する濃度検知手段と、前記像担持体上のホームポジションを基準とした該像担持体の各位相における偏心データを記憶する記憶手段と、前記ホームポジションを基準とした前記参照画像の位相を検知するホームポジション検知手段とを備え、前記濃度検知手段が検知した参照画像の濃度を、前記参照画像が形成された位相における前記偏心データに基づいて補正することを特徴とする。

【００１３】また、前記像担持体を直径１４０㎜以上の

ドラム状に形成してもよい。

【００１４】

【作用】以上構成に基づき、濃度検知手段が検知する参照画像の濃度は、参照画像が形成されている位置での像担持体の偏心量、すなわち濃度検知手段と参照画像との距離によって変化する。つまり、参照画像の濃度が一定であっても、その形成される位置が異なると偏心量が変化するため、異なった濃度として検知されてしまう。像担持体上にホームポジションを設け、このホームポジションを基準として像担持体の各位相における偏心データを記憶する一方、同じホームポジションを基準として参照画像が形成された位置の位相を検知する。これにより、参照画像が形成された位置における像担持体の偏心量を検知することができ、この偏心量に基づいて、参照画像の検出濃度に補正を加えて、正規の濃度を知ることができる。

【００１５】

【実施例】以下、図面に沿って、本発明の実施例について説明する。

〈実施例１〉図１に、本発明に係る画像形成装置の一例として、フルカラー画像を形成するためのカラー画像形成装置の概略図を示す。

【００１６】本実施例の画像形成装置は、像担持体である感光ドラム１が矢印Ｒ１方向に回転自在に支持されている。この感光ドラム１の周囲には、その回転方向に沿って順にコロナ帯電器２、光学系３、現像装置５、転写装置６、クリーニング器７が配置されている。

【００１７】光学系３は、原稿走査部と色分解フィルタからなり、色分解された光像Ｅ、またはこれに相当する光像Ｅを感光ドラム１に照射する、例えば図示のレーザビーム露光装置である。

【００１８】帯電器２により一様に帯電された感光ドラム１に、各分解色ごとに光像Ｅを照射し、静電潜像を形成する。現像装置５は回転現像器とされ、中心軸５ａを中心として回転する回転体５ｂ、及びそれに搭載された４個の現像器、つまりブラック現像器５ＢＫ、シアン現像器５Ｃ、マゼンタ現像器５Ｍ、イエロー現像器５Ｙを備えており、所定の現像器を感光ドラム１に対向した現像位置へと回転させて感光ドラム１上の静電潜像に樹脂を基体としたトナーを付着させて現像し、感光ドラム１上にトナー像を形成する。

【００１９】さらに、感光ドラム１上のトナー像は、記録材カセット（不図示）から搬送系及び転写装置６を介して感光ドラム１と対向する転写位置Ｎに（図中点線で示した紙パスに従って矢印Ｋ１方向に）供給された記録材に転写される。転写装置６は、本例では転写ドラム６ａ、転写コロナ帯電器６ｂ、記録材を静電吸着させるための吸着コロナ帯電器６ｃとこれに対向する吸着ローラ６ｄ、内側コロナ帯電器６ｅ、外側コロナ帯電器６ｆとを有し、回転駆動されるように軸支された転写ドラム６ａの周面開口域には誘電体からなる記録材担持シート６ｇが円筒状に一体的に張設されている。転写ドラム６ａが回転するに従って感光ドラム１上のトナー像は、転写帯電器６ｂにより記録材担持シート６ｇに担持された記録材上に転写される。記録材担持シート６ｇに吸着搬送される記録材には所望数の色画像が転写され、フルカラー画像が形成される。

【００２０】このようにして所望数のトナー像の転写が終了すると、記録材は転写ドラム６ａから分離手段９によって分離され、熱ローラ定着器１０を介して出力画像を得る。他方、転写後の感光ドラム１は、表面の残留トナーをクリーニング器７で清掃された後、再度、画像形成プロセスに供せられる。

【００２１】現像剤の濃度制御は、上述の一連の画像形成プロセスと並行して行われる。図２のように予め定められた濃度に対応するパッチ状のパッチ潜像（参照静電潜像）を感光ドラム１上に形成し、これをトナーで現像してパッチ状のパッチ画像（参照画像）Ｐとし、このパッチ画像Ｐに光学反射光量検知方式の濃度検知センサ（濃度検知手段）１１のＬＥＤ１１ａから光を照射し、その反射光をフォトダイオード１１ｂで受光してパッチ画像Ｐの濃度を検知する。パッチ画像形成位置の感光ドラム偏心量に基づいて濃度検知センサ１１の出力に補正を加え、その補正値と基準値とを比較して差分を取り、この差分より現像剤濃度の変動量を算出し、これをトナー補給量（補給時間）に換算し、トナー補給槽から所定量のトナーを現像装置５内へ補給を行うことにより、出力画像濃度を一定に保つように制御している。

【００２２】図３は、現像位置において感光ドラム１の偏心量を各位相ごとに測定したときの図であり、この偏心によってＳ－Ｄギャップが変動し、画像濃度及び濃度検知センサ出力が図４のように変化する。感光ドラム１の各位相ごとの偏心量は、感光ドラム１上に設定したホームポジションＭを基準として、記憶手段（不図示）に記憶させておく。

【００２３】図１に示すように、濃度検知センサ１１の近傍に、感光ドラム１に対向させてホームポジションセンサ（ホームポジション検知手段）１２を設け、ホームポジションＭの位置と、感光ドラム１の偏心データと、ホームポジションＭからパッチ画像Ｐまでの位相とにより、パッチ画像Ｐの形成される位置のＳ－Ｄギャップ変動による濃度検知センサ出力の変動値を算出することができる。つまり諸条件を現像剤濃度５ｗｔ％、Ｓ－Ｄギャップ５００μｍであるとすれば、図３のＡの位置に感光ドラム１のホームポジションＭがあり、Ｂの位置でパッチ画像Ｐを形成したとすれば、Ｂの位置での偏心量（＋２５μｍ、このときＳ－Ｄギャップは４７５μｍ）により濃度検知センサ出力は、図４より、５０ｍＶ適正値より低い値（０．９５Ｖ）となって検知される（ただし、偏心量の＋方向はＳ－Ｄギャップが縮まる方向とす

る。）。したがって、濃度検知センサ１１の検知出力に５０ｍＶを加え、基準値（偏心量０のときのパッチ濃度検知センサ出力１．０Ｖ）との差分信号によって現在の現像剤濃度変動量を正確に検知することができる。また同様に図３のＣ位置にパッチ画像Ｐを形成したとすれば、Ｓ－Ｄギャップは５０μｍ広い５５０μｍとなり、約１００ｍＶ出力信号が高く（１．１Ｖ）検知され、その検知出力より１００ｍＶを引き、基準値との差分を取ることによって正確な信号を得る。つまり、機械的または電気的に、感光ドラム１にホームポジションセンサ１２を設け、感光ドラム１の偏心データをメモリし、ホームポジションＭよりパッチ形成位置までの位相を測定し、その位相差によってＳ－Ｄギャップ変動、濃度検知センサ１１の出力変動を補正し、安定した現像剤濃度、出力画像を得ることができる。

【００２４】なお、本実施例では、カーボン含有の黒トナーを用いているが、カーボンの含有や色によらず同様の効果を得ることができる。

〈実施例２〉図５はフルカラー複写機の全体構成図である。

【００２５】この複写機は、上部にデジタルカラー画像リーダ部Ｉ、下部にデジタルカラー画像プリンタ部IIを有する。

【００２６】リーダ部Ｉにおいて、原稿を原稿台ガラス２１上に載せ、露光ランプ２２により露光走査することにより、原稿からの反射光像を、レンズ２３によりフルカラーセンサ２５に集光し、カラー色分解画像信号を得る。カラー色分解画像信号は、増幅回路を経て、ビデオ処理ユニット（いずれも不図示）にて処理を施され、プリンタ送出される。

【００２７】プリンタ部IIにおいて、像担持体である感光ドラム１は矢印Ｒ１方向に回転自在に支持され、感光ドラム１の周りには、前露光ランプ２６、コロナ帯電器２、レーザ露光光学系３、電位センサ２７、色の異なる４個の現像器５Ｙ、５Ｃ　５Ｍ、５ＢＫ、ドラム上光量検知手段（濃度検知センサ）１１、転写装置６、クリーニング器７が配置されている。

【００２８】レーザ露光光学系３において、リーダ部Ｉからの画像信号は、レーザ出力部（不図示）にて光信号に変換され、変換されたレーザ光がポリゴンミラー３ａで反射され、レンズ３ｂ及びミラー３ｃを通って感光ドラム１の表面に投影される。

【００２９】プリンタ部IIの画像形成時には、感光ドラム１を矢印Ｒ１方向に回転させ、前露光ランプ２６で除電した後の感光ドラム１を帯電器２により一様に帯電させて、各分解色ごとに光像Ｅを照射し、静電潜像を形成する。

【００３０】次に、所定の現像器を動作させて、感光ドラム１上の静電潜像を現像し、感光ドラム１上に樹脂を基体としたトナー像を形成する。各現像器は、偏心カム２９Ｙ、２９Ｃ、２９Ｍ、２９ＢＫの動作により、各分解色に応じて択一的に感光ドラム１に接近するように構成されている。

【００３１】さらに、感光ドラム１上のトナー像を、記録材カセット３０より搬送系及び転写装置６を介して感光ドラム１と対向した位置に供給された記録材に転写する。転写装置６は、本例では転写ドラム６ａ、転写帯電器６ｂ、記録材を静電吸着させるための吸着帯電器６ｃとこれに対向する吸着ローラ６ｄ、内側帯電器６ｅ、外側帯電器６ｆとを有し、回転駆動されるように軸支された転写ドラム６ａの周面開口域には誘電体からなる記録材担持シート６ｇを円筒状に一体的に張設している。記録材担持シート６ｇはポリカーボンネートフィルム等の誘電体シートを使用している。

【００３２】ドラム状とされる転写装置、つまり転写ドラム６ａを回転させるに従って感光ドラム１上のトナー像は、転写帯電器６ｂにより記録材担持シート６ｇに担持された記録材上に転写される。

【００３３】このようにして記録材担持シート６ｇに吸着搬送される記録材には所望数の色画像が転写され、フルカラー画像を形成する。

【００３４】フルカラー画像形成の場合、４色のトナー像の転写を終了すると記録材を転写ドラム６ａから分離爪９ａ、分離押し上げコロ９ｂ及び分離帯電器６ｈの作用によって分離し、熱ローラ定着器１０を介して排紙トレイ３１に排出する。

【００３５】他方、転写後の感光ドラム１は、表面の残留トナーがクリーニング器７で清掃された後、次なる画像形成プロセスに供される。

【００３６】また、転写ドラム６ａの記録材担持シート６上の粉体の飛散付着、記録材上のオイルの付着等を防止するために、ファーブラシ３２と記録材担持シート６ｇを介して該ブラシ３２に対向するバックアップブラシ３３や、オイル除去ローラ３５と記録材担持シート６ｇを介して該ローラ３５に対向するバックアップブラシ３６の作用により清掃を行なう。このような清掃は画像形成前もしくは後に行ない、また、ジャム（紙づまり）発生時には随時行なう。

【００３７】現像剤の濃度制御動作は、上述の画像形成プロセスと並行して行われる。予め、感光ドラム１の偏心を測定し、ホームポジションＭとの関係をメモリする。次にパッチ画像Ｐを形成し、濃度検知センサ１１で濃度を検知する。そして、パッチ画像形成位置とホームポジションＭとの位相差による偏心量に基づいて濃度検知出力に補正を行い、基準値と比較して現像剤濃度の変動量を算出し、これをトナー補給量へと換算し、現像剤の補給を行うことによって、現像剤濃度、出力画像濃度を安定させることができる。図６は感光ドラム１の直径が１８０㎜の場合の偏心量を測定したものであるが、直径が大きくなればなる程偏心量は増加し、直径１４０㎜

を超えるあたりから、偏心による画像濃度ムラが目立ちやすくなる。本発明は、このように感光ドラム１が大径である場合において、高画質を得ようとするときに特に効果が大きい。

〈実施例３〉実施例２のような大径の感光ドラム１を用いた画像形成装置では、特に感光ドラム１の偏心により帯電器２による感光ドラム１の帯電電位が、図７のａ（実線）に示すように、偏心の周期によって変動してしまう。感光ドラム１にホームポジションＭをもたせて検知し、感光ドラム１の偏心を検知し、帯電器２の帯電電圧に補正を行うことによって同図のｂ（一点鎖線）に示すように帯電によるムラを減少させることができ、均一な出力画像を得ることができた。

【００３８】

【発明の効果】以上説明したように、本発明によると、像担持体上に形成した参照画像の濃度を検知するに際し、ホームポジション検出手段等を介して像担持体の偏心量を検知し、これに基づいて検出濃度を補正することによって、正確な濃度を得ることができる。したがって、この正確な濃度をもとに、例えば、現像装置に対するトナーの補給等を行うことによって、２成分現像剤における所定のトナー濃度を維持することができ、最終的な出力画像の濃度ムラをなくして良好な濃度の画像を形成することができる。

【図面の簡単な説明】

【図１】実施例１の画像形成装置の概略を示す縦断面図。

【図２】濃度検知センサの構成を示す斜視図。

【図３】感光ドラムの偏心の状態を示す図。

【図４】Ｓ－Ｄギャップと濃度検知センサの出力との関係を示す図。

【図５】実施例２の画像形成装置の概略を示す縦断面図。

【図６】実施例２の、大径（直径１８０mm）の感光ドラムの偏心の状態を示す図。

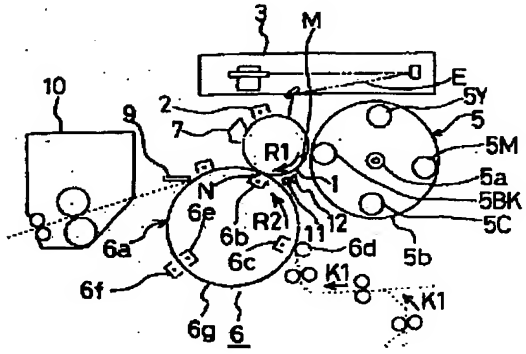
【図７】感光ドラムの偏心による帯電ムラを示す図。

【図８】従来の画像形成装置の概略を示す縦断面図。

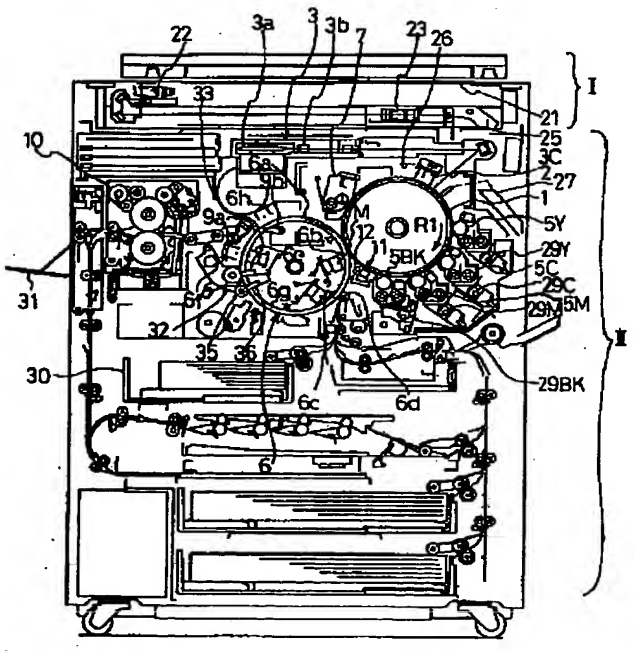
【符号の説明】

１	像担持体（感光ドラム）
５	現像装置
１１	濃度検知手段（濃度検知センサ）
１２	ホームポジション検知手段（ホームポジションセンサ）
Ｍ	ホームポジション
Ｐ	参照画像（パッチ画像）

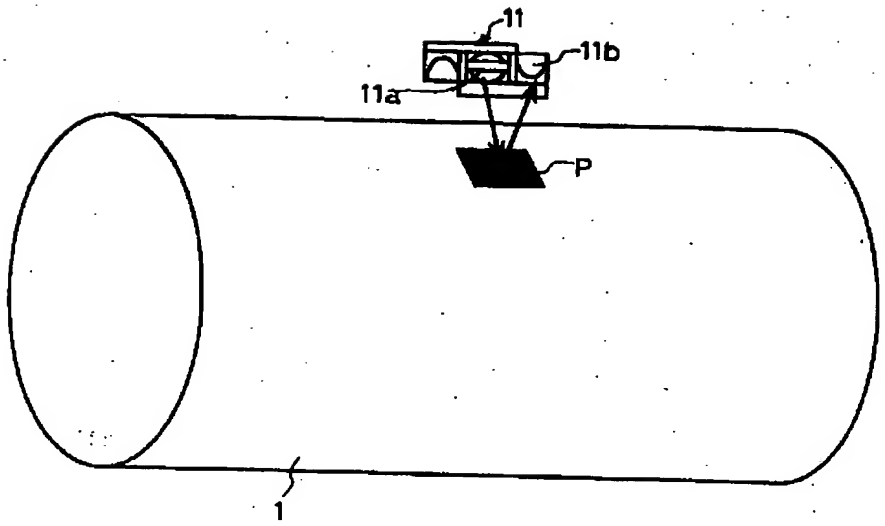
【図１】



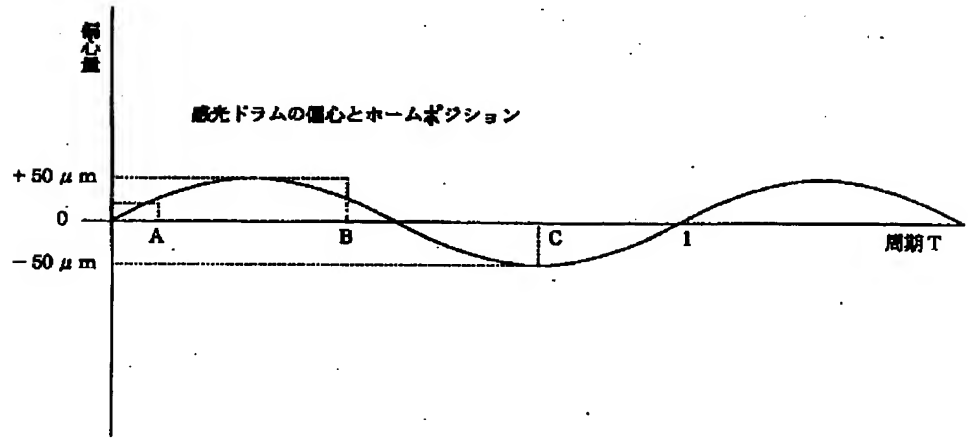
【図５】



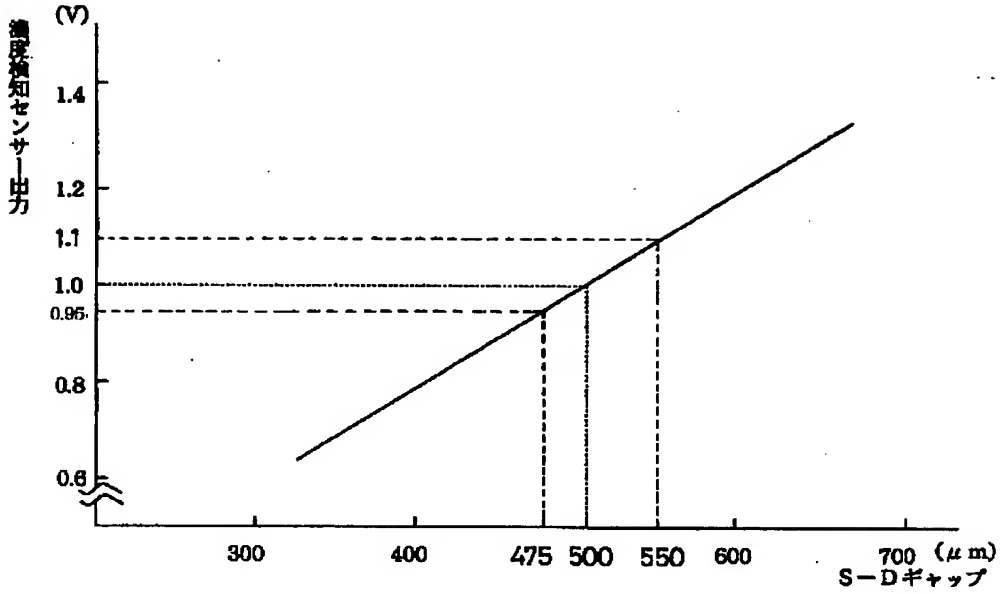
【図２】



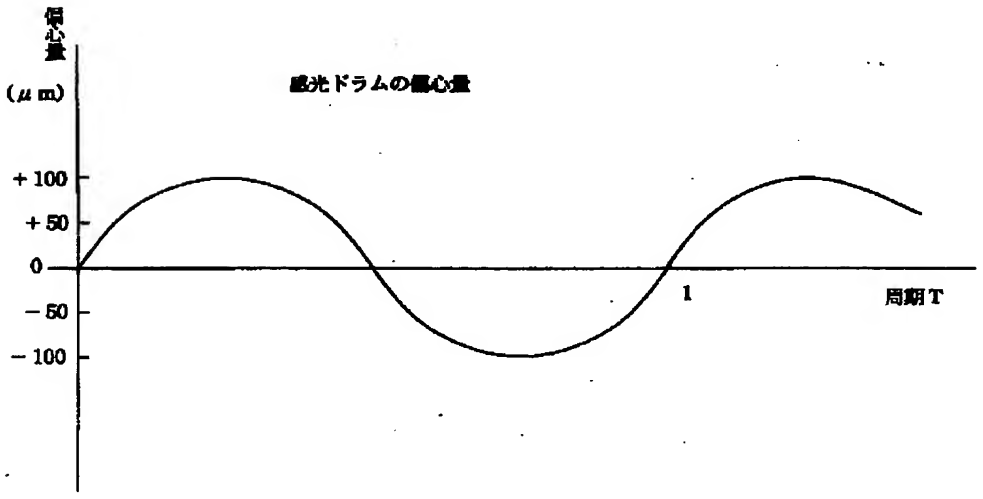
【図３】



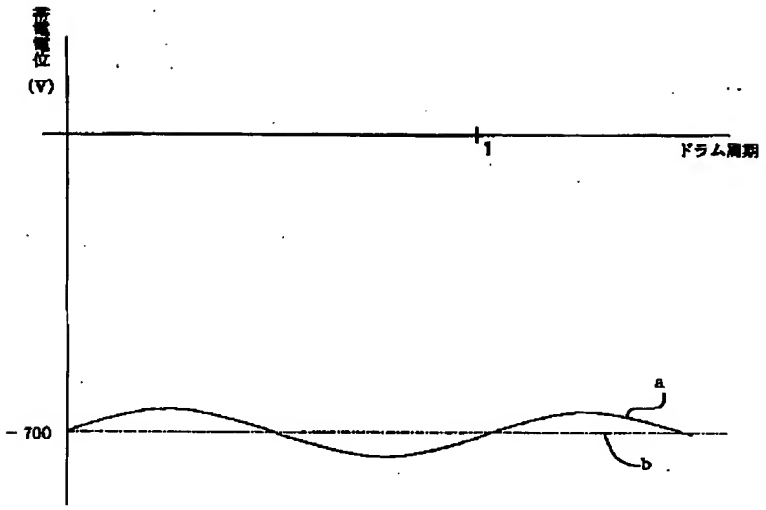
【図４】


濃度検知センサー出力
(V)
1.4
1.2
1.1
1.0
0.95
0.8
0.6
300
400
475
500
550
600
700 (μm)
S－Dギャップ

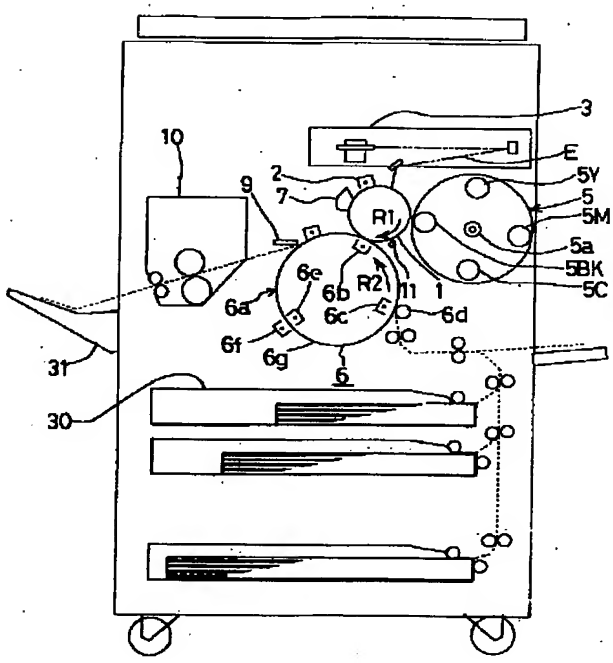
【図６】


偏心量
(μm)
感光ドラムの偏心量
+100
+50
0
−50
−100
1
周期T

【図７】


(V)
1
ドラム周期
a
－700
b

【図８】


3
10
E
2
9
7
5Y
5
R1
5M
5a
6e
6b
R2
11
1
5BK
5C
6a
6c
6d
6f
6g
6
31
30

フロントページの続き

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